Environment Canada Environnement Canada

Federal Water Policy

Canada

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Water is a remarkable substance. Although a simple compound, it shrouds two-thirds of the planet, caps the poles and pervades the air we breathe. It is the genesis of and the continuing source of life. Without water, humankind -- indeed, all forms of life on Earth -- would perish.

Water seems to be everywhere. We skate and ski on it, we sail over it and we fish in it. We use it to refresh our spirits, transport our goods and lure our tourists. We baptise our children in it, and dump our sewage into it. And, of course, we drink it in order to survive. When there is too little water, we suffer drought. When there is too much, we suffer floods.

Still, we Canadians tend to be complacent about water. It is an article of faith that our country is lavishly endowed with crystaline rivers and lakes. Generations of us have been conditioned to view Canadian water as a bottomless well. But the well is neither as deep nor as full as we think.

The truth is that Canada, which occupies 7% of the world's land mass, has 9% of its renewable water. So, we have just about our fair share. Even that fact, however, is misleading. About 60% of Canada's freshwater drains north, while 90% of our population lives within 300 kilometres of our southern border. In other words, to the extent that we Canadians have lots of water, most of it is not where it is needed, in the populated areas of the country. In those populated areas where it is plentiful, water is fast becoming polluted and unusable. The overall problem in the country is compounded by drought in certain regions. Put simply, Canada is not a water-rich country.

That is why the Government of Canada emphatically opposes large-scale exports of our water. We have another reason for our opposition; the inter-basin diversions necessary for such exports would inflict enormous harm on both the environment and society, especially in the North, where the ecology is delicate and where the effects on Native cultures would be devastating.

We must manage water like any other valuable resource -- with care. The object should be to use it in our own time in a way that leaves it unimpaired for our children and their children after them. Most of all, we must recognize its worth.

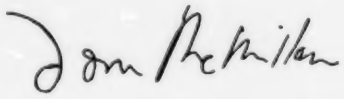
The federal water policy in this document calls for a radically new attitude toward Canada's water -- one that attaches real value to the resource itself. The policy also recognizes the need for a more open style of decision-making in this area. Because the public gains when policies work and suffers when they don't, it makes sense for the government to involve Canadians in every facet of water management.

The water policy sketches broad courses of action that call for federal

leadership, but other levels of government, industry and the public have important roles as well. The scientific, legislative and institutional approaches set forth in the document are not presented as panaceas. Nor has every "i" been dotted or every "t" crossed.

We also intend to refine the proposals presented here and to advance others in the months ahead. In all cases, we will be guided by the report of the Inquiry on Federal Water Policy (the Pearse Inquiry), which submitted its findings in September 1985.

Providence has blessed Canada with its share of water -- but only its share. I invite all Canadians to help their government safeguard this priceless resource. The obstacles should not be minimized. But neither should we underestimate our capacity to exercise wise stewardship. This document seeks to involve everyone in pursuit of that objective.



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The Need for a Policy

We must now start viewing water both as a key to environmental health and as a commodity that has real value, and begin to manage it accordingly

Almost two decades have passed since the current direction of federal water policy was established and the legislative base substantially expanded to protect water systems from the adverse impact of a rapidly expanding industrial society. In retrospect, the management approach of the 1970s could be characterized as reactive - responding to and dealing with problems as they arose. This approach has had some success with highly visible forms of pollution and other conventional water issues, but it is now proving to be inadequate.

Canadians have shown a growing awareness of and concern about the complex and serious problems they perceive as threatening their health and as outpacing the ability of governments to solve. These concerns include: the management of toxic chemicals and their effects on various water uses, particularly on drinking water; rapidly increasing water demands in water-deficient regions; the deterioration of municipal water supply and sewage treatment infrastructure; implications of climatic change; and potential large-scale interbasin transfers of water. But, in spite of such growing recognition of water as essential for the life and health of people and ecosystems, the resource continues to be taken for granted, undervalued and, consequently, overused and abused.

The abundance of Canada's water supplies has been a prime factor in shaping public attitudes and federal and provincial policies. Despite rapid growth in economic and social needs, technological developments and new environmental requirements, generations of Canadians have felt free to use and abuse their water resources as the result of low pricing. (Canada's per capita water use is now among the highest in the world and the prices charged for it are among the lowest.)

Governments must go beyond the symptoms to the causes of the problems and take new approaches with the changing realities in mind. New mechanisms are required to protect the resource and allocate diminishing water supplies among increasing and competing uses. This policy has been developed in a manner consistent with other federal policy objectives, including fiscal restraint and public health. The most effective mechanism for realizing this policy lies in developing anticipatory and preventive approaches to managing the quality and quantity of Canada's water resources in a way that acknowledges their value in social, economic and environmental terms.

Federal Water Policy: Overview

The Federal Water Policy is a statement of the federal government's philosophy and goals for the nation's freshwater resources, and of the proposed ways of achieving them. It recognizes that water is, at present, Canada's most undervalued and neglected natural resource. In no part of Canada is freshwater of sufficient quality and quantity that it can continue to be overused and abused in the way it has been in recent decades. The underlying philosophy of the policy is that Canadians must start viewing water both as a key to environmental health and as a scarce commodity having real value that must be managed accordingly.

A joint and co-operative management approach with the provinces is sought by the federal government since, under the Constitution Act, the provinces exercise direct control over many aspects of water management. The federal government intends to work with the provinces and territories to encourage the provision of safe and sufficient water supplies for Canadians in areas of federal and shared jurisdiction. The Federal Water Policy demonstrates leadership by its commitment to developing and applying the concept of "a fair value for water." In doing so, the federal government will respect provincial jurisdiction and international obligations, and proceed in a manner that furthers social and political goals and contributes to regional development.

In addition to the division of legislative powers between the federal and provincial governments, as stated in the Constitution Act, the discussion contained herein is set against a backdrop of:

- the federal government's economic policy statement of November 1984, which reports on how the federal government intends to provide leadership in economic renewal in Canada;
- the September 1985 Report of the Inquiry on Federal Water Policy, the results of extensive consultation on that report, and representations made by other levels of government, the public and national interest groups;
- the September 1987 Report of The National Task Force on Environment and Economy; and
- policy initiatives by various federal agencies.

In essence, the aforementioned reports and initiatives have underlined the importance of the following broad social and economic concepts: federal deficit reduction without compromising federal responsibilities; sustainable economic development which recognizes the dependence of a productive economy upon a healthy environment; and an environmental ethic reflecting an appreciation of and respect for the full range of resource values essential to the maintenance of Canada's resources.

Mindful of the broader context, the Federal Water Policy consists of an overall objective, two specific goals and five strategies, or broad courses of action, with protection and enhancement as well as realistic pricing and valuation of water as the dominant themes. This Policy overview is followed by statements of specific policy related to water concerns, which have implications for the federal government. The purpose of the statements is to demonstrate the application of the policy strategies in relation to selected areas of federal concern. The range of these concerns is not intended to be exhaustive, and the analysis will evolve as this policy and others (federal, provincial, territorial or international) take effect and as conditions change. Appendix A provides a brief description of areas of federal and provincial responsibility.

The Policy

The overall objective of the federal water policy is to encourage the use of freshwater in an efficient and equitable manner consistent with the social, economic and environmental needs of present and future generations.

The purpose of the Federal Water Policy is to set down the goals and actions by which the federal government intends to contribute to this objective through its own and through co-operative programs, the development of information and expertise, technological development and transfer, and promotion of public awareness. But this objective should not be just the government's - water so pervades our lives that all sectors of society and Canadians individually must embrace the fundamental "value of water" concept.

Goals

The federal government has identified two main goals with respect to water:

1. **To protect and enhance the quality of the water resource**

This goal means anticipating and preventing the contamination of all Canadian waters by harmful substances, and working to encourage the restoration of those waters that are contaminated. It is now realized, however, that more stringent regulations and standards alone cannot protect our water resources without economic incentives (and penalties) to prevent their impairment. This policy emphasizes the promotion of the "polluter pays" principle, which will re-direct the inevitable costs of pollution reduction to those responsible. As a result, costs are distributed more fairly to the benefit of all Canadians and the environment as a whole.

2. **To promote the wise and efficient management and use of water**

This goal means establishing new ground rules and procedures that respect the value of water to all sectors of society and to the environment. The key innovation is to recognize the value of the resource - both by promoting the realistic pricing of water used, and by respecting the value of recreational water uses and other similar uses where direct charges are not applicable. As a result, governments will be able to reduce their water investments and improve the operating efficiency of water systems through better technology and practices. The private sector and individuals will benefit in direct savings to particular water users, growth of environmental industries, personal health and, ultimately, the peace of mind that comes from knowing that Canada's water will be safe for both present and future generations.

Strategies

The federal government proposes to use five strategies to reach its stated goals, and will be guided in its actions over the near future by the analysis of a selection of water concerns with implications for the federal government. The five strategies are broad courses of action which define a supportive, yet flexible, role for the federal government, one that enables the various federal agencies, other levels of government, and industry, to respond to their particular circumstances and challenges. This approach is compatible with the federal structure and the realities of a large and diverse country.

Development of the Federal Water Policy began with a review of a wide range of water-related matters to discover how the federal government might respond to various water concerns. That exercise revealed that the five strategies chosen were the ones most consistently applied across the whole spectrum of water concerns.

These broad courses of action are not panaceas, but will be adapted over time to changing circumstances and to any new water-related concerns requiring federal attention. Most important of all, the federal government counts on a continuing high degree of co-operation with provincial and territorial governments as well as with multilateral institutions and other nations in all water resource matters.

Strategy 1

Water Pricing

Despite recognition of the necessity of water for the life and health of people and ecosystems, the resource has generally been taken for granted, undervalued and, consequently, overused and abused. Canada's per capita water-use rates are among the highest in the world and the prices charged for it are among the lowest. In addition, Canadians have tended to undervalue instream uses in their water management decisions, with very expensive long-term consequences.

Until now, Canadians have become accustomed to a plentiful supply of low-priced water through government subsidies and an emphasis on supply-side management. But realization is beginning to dawn that nominal charges have fostered the overuse of water which, in turn, has resulted in the need for larger, more costly infrastructure to treat, store and distribute the water, and to treat wastewater. Yet, the billions of dollars required for the development or rehabilitation of water and wastewater systems cannot be met from existing funding mechanisms. Water pricing is, therefore, a solution.

Realistic water pricing would make the users conscious of the real value of the resource and delivery systems, and would reduce the demand on those systems; it would also encourage efficiency through improved technology, and lead to water conservation and reduced pressures for costly system expansion. Pricing of water is exercised mainly by provincial and local governments. The federal government will apply this concept in its own areas of jurisdiction, promote the use of market and market-type forces and beneficiary/pollutor pays policies to achieve the most efficient long-range use of water resources, and participate with other levels of government in meeting its responsibility in a manner that recognizes the social, economic and environmental value of freshwater resources to Canadians.

The federal government is committed to the concept of "a fair value for water." To implement this concept in federal policies, programs and initiatives, the federal government will:

- endorse the concept of realistic pricing as a direct means of controlling demand and generating revenues to cover costs;
- develop new water-efficient technologies and industrial processes that minimize costs, and encourage water conservation and improved water quality;
- undertake, support and promote joint federal-provincial examination of the costs and pricing of water for both consumptive and non-consumptive water uses; and
- encourage the application of pricing and other strategies, such as the beneficiary/pollutor pays concept, to encourage efficient water use.

Strategy 2

Science Leadership

Scientific and socio-economic research, technological development and data collection are essential tools for dealing with the increasing scope and complexity of the emerging resource problems. Effective management of the water resource, whether through regulation, establishment of guidelines and codes of practice, or through leadership by example, is dependent upon a scientifically sound knowledge base developed in co-operation with all responsible jurisdictions and the private sector.

These co-operative efforts must deal with the need for research in the fields relevant to the understanding of current and future water issues of national and regional significance, and they must ensure that the water data (quantity, quality and use) that describe the health and value of Canada's freshwaters are reliable and readily available. Water-based economic development that is environmentally compatible also requires co-operation in developing new and improved technology, and in transferring it effectively.

In recognition of the national leadership role it must play in this endeavour, the federal government will:

- conduct and encourage the undertaking of physical, chemical, biological and socio-economic investigations, which are directed to current and emerging issues;
- establish research advisory mechanisms with broad representation from scientific and applied research clientele, to advise on program needs and priorities;
- develop and maintain, with the provinces and territories, water data and information systems directed to improving the knowledge available for managing Canada's water resources;
- promote co-operative federal-provincial endeavours when the objectives are of joint interest;
- undertake and support research and technological development and transfer efforts;
- encourage opportunities for non-governmental technological development, and the growth of a private sector water conservation industry; and
- foster international co-operation in scientific and technological research and development and in data and information collection systems.

Strategy 3

Integrated Planning

The federal government endorses an integrated approach to the planning and development of water resources in order that increasing demands upon the quality and quantity of the resource are met efficiently and equitably, and in a manner that ensures that the many values of water and related resources are recognized, and ensures the continued productivity of the resource and the ecosystems dependent upon it.

The integrated approach takes into account all water uses and water-related activities, within whatever political, administrative, economic or functional boundaries they are defined. Increasingly, watersheds are becoming the preferred spatial unit for water resource planning. It is an approach that makes sense at any scale of planning, whether governmental or private, but for the major river basins, integrated water resource planning is practically synonymous with joint federal-provincial-territorial planning. The interdependence and growing competition among water users, and the recognition of recreational, social, environmental and heritage values are additional reasons for the increasing importance of co-operative planning between the various levels of government agencies and institutions.

In support of its commitment to this strategy of integrated, long-term planning for the development and management of water and related resources, the federal government will:

- adhere to integrated water resource planning in areas of federal jurisdiction, and in interjurisdictional waters subject to federal-provincial-territorial agreements, in order to ensure that all values are given full consideration;

- encourage, on the basis of a watershed, or other appropriate spatial unit, the integration of water management plans and objectives with those of other natural resource interests - fisheries, forestry, wildlife, mining, hydro power, and agriculture - to reflect the unity of natural processes and the interdependence of uses and users in that spatial unit;

- establish and apply evaluation criteria to all federally sponsored projects to ensure their compatibility with federal goals respecting water management, based on an appreciation of the values of water and related resources;

- ensure that all significant national and international water-related development projects, which are supported or initiated by the federal government or for which federal property is required, are subject to the Federal Environmental Assessment and Review Process, so that potential adverse environmental and socio-economic effects can be identified and, to the extent possible, mitigated;

- ensure the participation or co-operation of all relevant co-ordinating and regulatory agencies; and

- encourage and support opportunities for public consultation and participation in the integrated planning process.

Strategy 4

Legislation

Water resource management in Canada is governed by both provincial and federal statutes. Provinces exercise proprietary rights over the water resource and, therefore, have the authority to legislate on all aspects of water supply, use, pollution control, hydroelectric and non-nuclear power development, irrigation and recreation. The legislation passed by Parliament on water and water-related activities relates to those activities over which the federal government has jurisdiction. The statutes deal with fisheries, the protection of navigable waters, shipping, some specific aspects of environmental protection, drinking water in areas of federal jurisdiction, international water management, and federal-provincial-territorial co-operation in water resources planning and management.

The remedial approach of the present legislative measures dates back to the 1970s, however, and is proving to be incapable of solving all emerging water resource issues, particularly those relating to toxic substances. There is a clear need to modernize the legislative base to make it more anticipatory and comprehensive and, to protect the health and safety of Canadians and the many values of water and related resources which have heretofore been taken for granted.

In addition, there is a need to ensure that federal legislative provisions in support of federal water policy goals are coherent and consistent in approach and implemented efficiently. In the interests of efficiency, increased emphasis is required on cooperation with all concerned jurisdictions and agencies to streamline the regulatory process for management of water quality and quantity, to eliminate wasteful duplications and to reduce the regulatory burdens on all Canadians.

To these ends, the federal government will renew, consolidate or otherwise strengthen the application of existing federal legislation, so as to:

- produce legislative provisions to address interjurisdictional water issues relating to levels, flows and quality;
- control and manage toxic chemicals throughout their entire life cycle - from production to disposal;
- establish water quality standards and guidelines to better protect human health and the diversity of species and ecosystems;
- encourage existing mechanisms like the Prairie Provinces Water Board and develop others to address potential provincial-territorial and interprovincial water conflicts; and
- ensure the effectiveness of regulatory measures through the provision of appropriate enforcement and compliance measures.

Strategy 5

Public Awareness

The adoption of new policies and approaches for the long-term protection and management of Canada's water resources requires a fundamental change in attitude towards the value and importance of water and related resources to society, the economy and the environment. But, this effort will be "too little, too late" unless concerted measures are undertaken to make Canadians fully aware of the pressures on their water resources and, therefore, on themselves and their environment.

The federal government recognizes a primary need for increasing public awareness with respect to water and encourages the media, education authorities and non-governmental organizations to do likewise.

The federal government acknowledges the necessity of providing opportunities for public input on water decisions that have broad social, economic or environmental implications. A well-informed public and clearly defined channels for public participation provide the best assurance that water management decisions will take into account the full spectrum of public values.

In order to promote public awareness and participation in programs and initiatives to improve and protect Canada's water resources, **the federal government will:**

- **ensure that the public is consulted and that its views are considered in all major federal water management decisions;**
- **encourage public participation and initiate, develop and deliver a national water conservation awareness program;**
- **encourage the efforts of provinces and non-governmental organizations in public information and awareness; and**
- **ensure public access to information on the extent and health of water resources through appropriate means, including a State of the Environment reporting system.**

Applying the Policy

Implementation of the Federal Water Policy is the responsibility of all departments and agencies of the federal government. Because responsibilities for water management are highly dispersed among provincial and territorial governments and federal departments, its successful implementation will depend upon harmonious institutional arrangements for co-ordinating the efforts of the governments concerned and their respective agencies.

At the federal level, the government will:

- ensure the effective co-ordination of federal water policies among federal departments and agencies;
- ensure a regular review of the water-related policies and programs of all federal departments to assess the degree to which these policies and programs are supportive of federal water policy;
- reconcile the water policy positions of all federal departments to promote a co-ordinated and thoughtful federal approach;
- ensure amendments or additions to federal water policy as appropriate; and
- apply the Environmental Assessment and Review Process to examine federally sponsored water-related developments and projects.

To achieve effective implementation of the policy, the federal government has designated the Interdepartmental Committee on Water (ICW) as the focal point for co-ordinating the policy among federal departments and agencies. As part of its responsibility, ICW will produce an annual report on the overall implementation of federal water policy, on the strengths and weaknesses of that policy's delivery and on areas for future examination; it will also serve as a focal point for explaining federal water policy and for providing integrated information on all aspects of that policy; and co-ordinate such interdepartmental studies as may be necessary to fulfil its terms of reference, and constitute subcommittees as may be appropriate to address particular problems or issues related to water policy.

At the federal-provincial-territorial level, the adoption and application of policy goals and strategies will be encouraged through existing and improved federal-provincial co-ordinating mechanisms and bilateral arrangements, which include:

- consultation and information exchange so as to encourage compatible water policies and co-operative programs through forums such as the Water Advisory Committee of the Canadian Council of Resource and Environment Ministers (CCREM);
- support for formal and informal consultative or advisory committees to deal with either a single issue or a range of water problems;
- intergovernmental agreements for co-operative programs with all provinces/ territories; and
- special agreements to respond to a particular water problem or issue in one or more of the provinces or territories.

At the international level, the policy will guide Canadian officials in their future bilateral and multilateral dealings with other national governments on water-related programs and activities.

Specific Policy Statements

This is an index to the statements of specific policy. The government intends to use these statements in applying the five policy strategies. The range of concerns is not intended to be exhaustive, and the policies will evolve in response to changing conditions.

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1. MANAGEMENT OF TOXIC CHEMICALS

The impact of toxic chemicals on human health and the environment is becoming an increasingly pressing issue facing Canadians today. Estimates vary, but it is commonly believed that there are up to 100 000 chemicals in commercial use throughout the world, with about 1 000 new ones entering the market every year.

In the past, response to threats to the environment took place after problems developed, after which offending discharges or effluents were recovered, treated or contained. Toxic chemical contamination, however, is more difficult to deal with. The traditional approach to pollution treatment is no longer enough. Ordinary sense perception cannot identify chemical contamination, but science is increasing its capacity to detect the presence of toxic substances in the environment and at extremely low levels.

As with many other issues in Canada, the management of toxic substances is divided between the federal and provincial governments. At the federal level alone, 24 departments administer a total of 58 Acts of Parliament dealing with various aspects of the control of chemicals. Many of these Acts and their regulations were developed in response to specific problems. The result was a "patchwork quilt" of legislation and regulations. Duplication and overlapping jurisdiction make it difficult for industry to comply. Worse still, there are gaps which make it difficult for governments to come firmly to grips with certain types of toxic chemicals.

To meet this situation, the federal government is enacting the Canadian Environmental Protection Act, a proposed statutory framework emphasizing an anticipatory and preventive approach to clarifying, co-ordinating and modernizing the federal environmental thrust. The framework would assist governments in controlling toxic chemicals throughout their life-cycle, that is, from their development, manufacture, transport, distribution, use, and storage, to their ultimate disposal. This "cradle-to-grave" management approach will cover both new and existing chemicals. New chemicals would have to be tested and their environmental and human health effects minimized before introduction into the Canadian marketplace. Existing chemicals would have more stringent controls applied to them as a result of more detailed testing and evaluation.

The federal government is committed to adopting a streamlined and consistent framework for dealing with toxic chemicals in Canada.

To this end, the federal government will ensure the establishment of:

- controls so that the life cycle of chemicals is properly managed;
- guidelines and objectives for federal departments, agencies, Crown corporations and regulatory bodies to ensure efficient and effective delivery of environmental protection programs;
- national environmental quality objectives and guidelines in co-operation with provinces, territories, industry and other sectors representative of Canadian society; and
- enforcement and compliance measures in relation to the Canadian Environmental Protection Act.

2. WATER QUALITY MANAGEMENT

The key to successful water quality management is the prevention of pollution before it occurs. The quality of water determines its suitability for use. Despite Canada's record of good environmental management, there are areas in the country where water quality conditions are worsening and many others are potentially threatened. Even when sufficient quantities of water are available, poor quality can be a limiting factor in its use. This problem is further aggravated when both water quantity and quality are limited.

There is ample proof that the direct costs associated with cleanup of impaired water quality are high, not to mention the indirect costs associated with health and other problems associated with water of inferior quality. As a result, one of the main thrusts of federal water policy is the prevention of water pollution.

The Canadian Water Quality Guidelines have been developed to protect water bodies for various uses, such as irrigation and recreation. The guidelines are also used to develop water quality objectives for the protection of users at a given location. The objectives indicate whether aquatic life in a water body is under stress or if pollution control measures are necessary. To be most effective, these matters depend on federal-provincial co-operation and on the support of environmental groups and the public.

The federal government will undertake, promote and encourage the protection and enhancement of the quality of water for the beneficial use of present and future generations.

To meet this commitment, **the federal government will:**

- **develop and apply, in co-operation with the provincial governments, appropriate strategies for identifying the nature and extent of the impairment of water quality;**
- **develop, with provincial governments, Canadian Water Quality Guidelines that are relevant to Canadian environmental conditions and encourage a uniform approach to establishing water quality objectives across Canada for the preservation of water quality;**
- **undertake, encourage and support measures to protect water quality;**
- **undertake, encourage and support water quality management through research and development; and**
- **seek to ensure that international and interprovincial water quality requirements are met.**

3. GROUND WATER CONTAMINATION

Only modest attention has been paid to ground water resources on a national scale because the nation's surface water supplies are so large.

Yet, one quarter of all Canadians depend on ground water for domestic use. It is known, too, that ground water sources sustain the value of wetlands, streams, lakes and other surface waters when surface runoff is light or nil. Any contamination associated with ground water, some of which occurs naturally, can, therefore, spread to surface waters and vice versa.

Pesticides in eastern Canada's ground water, leaking chemical dumps in central Canada and contamination from subsurface waste disposal and toxic chemical spills in the West are only some indicators of the extent of the ground water contamination problem. These matters pose the greatest urgency and deserve immediate attention.

Adequate data and information bases are essential starting points in addressing ground water concerns. But, the federal government must also develop the expertise needed to interpret that information and to develop and implement solutions.

For these reasons, the federal government perceives a need to upgrade its knowledge and databases on ground water to meet federal requirements. Some provinces have indicated that they would welcome federal assistance in addressing their ground water problems and many have developed excellent ground water databases.

The federal government is committed to the preservation and enhancement of the ground water resource for the beneficial uses of present and future generations.

To meet this commitment, **the federal government will:**

- **develop, with provincial governments and other interested parties, appropriate strategies, national guidelines and activities for ground water assessment and protection;**
- **conduct research and undertake technological development and demonstration projects in response to ground water problems;**
- **develop exemplary ground water management practices involving federal lands, responsibilities, facilities, and federally funded projects;**
- **develop measures to achieve appropriate ground water quality in transboundary waters; and**
- **provide information and advice on ground water issues of federal and national interest.**

4. FISH HABITAT MANAGEMENT

Fish habitats, the rivers, streams and lakes on which fish depend for their life process are hidden assets, which form the foundation of Canada's fisheries. It is, therefore, important that they be conserved from degradation and restored to their earlier potential where sufficient benefits can be expected. Commercial and recreational freshwater fisheries make a significant contribution to the overall economy. The fishery resource also plays an important role in supporting native lifestyle and remote communities.

Fish habitats are susceptible to harm from a variety of sources. Direct discharges of industrial, municipal and agricultural effluents, and physical change resulting from instream construction activity are the most visible sources of change. In addition, acid rain and airborne pollutants can threaten fish habitats.

The federal government released a national Fish Habitat Management Policy in October 1985, which committed it to achieving a net gain of productive fish habitat for the benefit of Canadians. In support of this goal, the federal government is committed to three strategies: conservation, restoration and development. The implementation of these strategies in areas of direct federal jurisdiction will ensure that Canadians continue to benefit from the freshwater fishery resource.

In co-operation with project proponents the federal government will support the achievement of net gain through use of the principles of no net loss. To meet this commitment, **the federal government will:**

- **develop national guidelines for the achievement of no net loss through incororating fish waterfront protection requirements into land and water use projects that could affect fish habitat;**
- **participate in and encourage integrated resources planning that will allow for the incorporation of fish habitat conservation measures early in the planning process;**
- **conduct scientific research to provide the information and technology necessary for the conservation, restoration and development of fish habitats;**
- **encourage and support involvement by government agencies, public interest groups and the private sector to conserve, restore and develop fish habitats and promote the establishment of national and regional committees, foundations or boards to work co-operatively with the Department of Fisheries and Oceans; and**
- **undertake monitoring and assessment of fish habitats in support of federal fish habitat management goals and objectives.**

5. PROVISION OF MUNICIPAL WATER AND SEWER INFRASTRUCTURE

Canadians are concerned about municipal and industrial pollution and its effects on environmental and other values. They also fear the long-term effects of all undesirable substances, whether natural or man-made, in their drinking water. Traditionally, water has been viewed as an unlimited resource to be offered to the user at little or no cost.

Municipal water and sewer systems are areas of provincial/municipal responsibility. From 1960 to 1980, a period of rapid urban expansion, the federal government provided loans and grants for the construction of main trunk sewers and sewage treatment plants and later for certain water supply systems. The program, which provided an added incentive to provincial/municipal action was terminated in 1980 when fiscal restraint brought federal assistance in an area of provincial/municipal responsibility into question. However, municipal water and sewer infrastructure can be considered under other federal programs, such as economic development and job training, if federal and provincial priorities coincide, and if the proposal meets the objectives of such programs.

Concern about the state of existing water and sewer systems has now been added to the need for the construction of new facilities. In fact, proposals have been made by other levels of government for federal cost-sharing for repair and upgrading of a wide range of municipal infrastructure - roads, bridges, sidewalks, as well as water and sewer systems.

In terms of water and sewer systems, realistic pricing for these services would encourage users to conserve water, raise the funds needed to build and maintain these costly systems, and encourage efficiencies and greater effectiveness through innovation.

Major government funding of water and sewers without such realistic pricing leaves consumers unaware of the true cost of the resource use, and the water tends to be wasted through excessive demand and inefficient use.

The federal government will encourage the development of a Canadian industry to produce the goods and services needed for municipal water and sewer infrastructure.

For its part, the federal government will:

- participate with provinces in the examination of costs and pricing of municipal water supply and treatment;
- advocate the pricing of water and sewer services at a level suitable to meet the development and rehabilitation of these services;
- implement proper environmental and health practices with respect to federal undertakings;
- participate with provincial and municipal governments in developing the requirements and programs to deal with industrial discharges to municipal treatment systems;
- undertake, support and promote research, development and transfer of new wastewater treatment technology; and
- consider financial assistance for projects that meet federal and provincial development priorities and are eligible for assistance under existing federal programs.

6. SAFE DRINKING WATER

Safe and sufficient drinking water supplies are essential to public health.

Protection and restoration of the integrity and wholesomeness of the nation's drinking water is a shared responsibility of the federal, provincial and municipal governments. Under the Constitution Act, provincial governments are generally responsible for ensuring potable community water supplies and the federal government has specific responsibility for areas under its jurisdiction, such as international and interprovincial carriers, federal lands and installations, and Indian Reserves.

Significant progress has been made by governments in controlling and treating visible sources of pollution. Public confidence in the safety of its drinking water is being shaken owing to the increasing number of potentially toxic substances being detected in water supplies.

The federal government is committed to ensuring safe drinking water within areas under its jurisdiction and to promoting and encouraging a consistent approach to protection and improvement of the nation's drinking water by provinces, territories and local governments.

To meet this commitment, the federal government will continue to:

- consider legislation to ensure the safety of drinking water within federal jurisdiction and to complement provincial and territorial programs;
- establish national drinking water quality guidelines to help all jurisdictions in setting safe drinking water standards;
- conduct research and support technological development and transfer in drinking water treatment processes; and
- promote public awareness and understanding of critical issues respecting drinking water safety, such as prevention of contamination of drinking water sources from land area runoff.

7. WATER USE CONFLICTS

Although Canada's overall water supply-demand balance is favourable, the aggregate picture disguises wide variations. Over 60 per cent of river flow is carried by northward-flowing rivers where only 10 per cent of Canada's population lives. About 36 per cent of the mean annual precipitation in Canada occurs as snow, usually resulting in low runoff as snow accumulates and high extremes as it melts. In many areas water pollution has rendered water supplies unsuitable for many uses. These factors, and others associated with drought and climate change, are influencing the distribution of available water and are contributing to water use conflicts.

When water is available in abundance, the possibilities for conflict between various water users are reduced, regardless of whether the water is withdrawn and used for cooling, manufacturing, mining, irrigation or municipal use, or used in its natural habitat for navigation, recreation, hydroelectric power, or by fish and wildlife. Many regions no longer enjoy clean water in abundance, and the potential for conflicts between users will increase as demands grow.

Traditionally, water management in Canada has focussed on harnessing, storing, regulating and diverting supplies to accommodate needs. This approach was convenient when the demand was small but, the growth in demand is resulting in user conflicts. The cost of meeting such demands has escalated, as has public opposition to the adverse social and environmental effects often associated with them. The need has arisen to explore alternative means of meeting demands and resolving such conflicts. The key is pricing, both in the literal sense of realistic charges for water services, and in the general sense of taking the resource's many values into account where direct charges are not pertinent.

In Western societies, most resource allocation is accomplished through the use of the price system and the interplay of the forces of supply and demand. Low prices, or an absence of pricing often leads to overuse and deterioration of the resource - especially resources such as water, which are held in common. Typically, water in Canada is underpriced if it is priced at all. Consequently, development of appropriate pricing mechanisms to help allocate water is seen as an effective way to encourage efficient water use. Furthermore, suitable pricing would not only create an incentive to avoid waste and reduce demand for expanded services, but it would make the user more conscious of the value of water, ensure that water be allocated to more beneficial uses, facilitate cost recovery, alleviate conflicts and promote the development of new conservation technology.

The federal government is prepared to undertake initiatives associated with its own mandate as well as to support provincial initiatives directed to meeting water demands and resolving real and potential conflicts. To this end, the federal government will:

- develop water demand management approaches in areas of federal jurisdiction with regard for varying social and economic conditions, and for intangible heritage and recreational values and encourage other jurisdictions to do the same;
- undertake, support, and promote research into establishing appropriate prices for water, identifying areas of potential user conflicts, and encouraging the development and transfer of water conservation technologies and practices;
- encourage an integrated resource planning and management approach to augmentation and allocation of water supplies in order to ensure that the full range of values are considered; and
- promote and support public awareness and public participation in water conservation.

8. INTERBASIN TRANSFERS

The impacts associated with major interbasin diversions and transfers of water raise unique problems requiring special consideration. Not only do interbasin transfers incur the social and economic costs and environmental effects that are generally associated with large water development projects, they also augment flows in one watershed at the expense of another and alter, perhaps irreversibly, the hydrological and environmental regime of both. Such transfers facilitate biota exchange, which may threaten unique ecosystems, introduce parasites and undesirable species, and disrupt local and regional economies. A significant characteristic of these transfers is that their consequences and the values, which would be either sacrificed or satisfied, are poorly understood.

Approximately 60 interbasin water transfers have been identified across Canada, resulting in a total transferred flow of 4450 m^3/s. This total is greater than that transferred in the next leading countries, the U.S. and the U.S.S.R., combined.

Historically, most large diversions in Canada have been designed to increase hydroelectric power generation. The social and environmental effects of large diversions in Canada only started to receive consideration in the 1970s (James Bay, Churchill-Nelson). With a few exceptions, existing interbasin diversions have been contained within provincial boundaries; however, proposed new diversions to meet either growing needs in water short areas, to forestall the potential impact of climatic warming or to export water to foreign markets, threaten serious interjurisdictional impacts and conflicts.

The federal government advocates exercising caution in considering the need for major interbasin transfers and endorses other less disruptive alternatives such as demand management and water conservation to satisfy societal needs without sacrificing water related values to irreversible actions.

In support of this view, the federal government will:

- draft guidelines and criteria for assessing interbasin transfers within Canada in co-operation with the provinces/territories;
- take all possible measures within the limits of its constitutional authority to prohibit the export of Canadian water by interbasin diversions; and strengthen federal legislation to the extent necessary to fully implement this policy; and
- develop with concerned provincial governments a mutually acceptable referral system to ensure that provincial licensing of small-scale transfers of water (local arrangements between communities, or containerized transfers) between jurisdictions take into account federal interests respecting navigation, fisheries, environmental protection, Indian Treaties and trade considerations.

9. WATER USE IN IRRIGATION

Irrigation places an intensive demand on supplies. Although it uses only 8 per cent of total national water withdrawal, 77 per cent of this amount is consumed through evaporation and lost to other uses. This level of consumption translates, in some western drainage basins, to over 70 per cent of annual reliable supplies. Further expansion of irrigation should be considered only in the light of other present and future uses, especially instream uses, which also share limited supplies.

The federal mandate in agriculture and associated water-related development, including irrigation, stems from several concerns and responsibilities: the importance of soil and water resources to a productive and competitive agri-food industry; balanced regional economic development; the general welfare of present and future Canadians with regard to secure national food supplies; a federal leadership role in research; and environmental quality.

Large areas in western Canada are favoured with productive soils. Economic policies have promoted irrigation to overcome the semi-arid conditions of much of the region, to increase yields in these soils and to enhance regional development opportunities through the stabilization and diversification of regional economies. Irrigation provides primary benefits to the farmer and secondary benefits to the local area, the province and the country. In each case, the secondary benefits have far exceeded the primary benefits to the farmer. Thus, a decision on whether to use water for irrigation must be based upon more than primary benefits alone. Irrigated agriculture raises a number of significant economic and environmental concerns. Still, governments need to assess carefully and consider the economic costs and environmental consequences associated with irrigation to ensure maintenance of the agricultural base and protection of other water and related resource values.

When proposals for irrigation are consistent with federal and provincial priorities, the federal government will:

- continue to support the best possible use of existing irrigation facilities through research and encourage efficient water use;
- support new development under economic development agreements, but only when it is based on a comprehensive set of considerations including:
  - availability of long-term market opportunities;
  - potential for diversification and value-added processing;
  - improvement in the viability of rural communities;
  - improvement in the level and stability of profit for individual farmers;
  - opportunities for other complementary multiple water uses; and
  - availability of a comprehensive environmental and economic impact assessment of local, regional and national economies.
- encourage evaluation criteria consistent with federal development initiatives including social, environmental and economic factors, and opportunity costs;
- encourage the development of realistic pricing and water conservation technologies and programs, and information programs directed to water conservation; and
- ensure that international and interprovincial apportionment requirements are met.

10. WETLANDS PRESERVATION

Wetlands covering 14 per cent of Canada's landscape are the interface between land and water ecosystems, and provide substantial ecological, social and economic benefits to Canadians. Collectively, wetlands are permanently or seasonally wet areas, shallow waters, and lake, river or coastal margins, including estuaries.

Wetlands can greatly influence water quality and quantity and are, therefore, an integral component of Canada's water resources. They serve as modifiers of water chemistry through the storage of environmental contaminants, and help mitigate the consequences of shoreline erosion and sedimentation. The effects of regional drought and flooding are substantially moderated by wetlands. They also contribute to ground water supplies.

In addition, wetlands have been recognized as one of Canada's most productive ecosystems, providing essential habitats for many species of waterfowl, fish, furbearers, and other wildlife, including rare and endangered species. Social benefits include recreational, educational, scientific and aesthetic opportunities.

Since settlement time, degradation and land use conversions of wetlands related to the development of agriculture and expansion of urban, port, marina and hydroelectric facilities have resulted in a major depletion of Canada's wetland resource base. Conservation is essential to maintaining the substantial economic benefits derived annually from wetlands as a result of hunting, trapping, fishing and the harvesting of forest peat and other natural products.

The federal policy is to conserve and enhance Canada's wetlands through short- and long-term actions co-ordinated with other governments, private organizations, land owners and the public. Accordingly, **the federal government will contribute to this effort by:**

- **reviewing and seeking to minimize the negative impact of federal policies, programs and activities on wetlands;**
- **identifying, conserving and managing wetlands of importance on federally owned or regulated lands;**
- **co-operating with other governments in conserving and managing wetlands which serve important hydrological roles associated with improving water quality, sustaining water quantity, and moderating flood events;**
- **encouraging appropriate land-use practices, integrated land and water resource planning, and application of environmental assessment processes and practices to mitigate undesirable effects on existing wetlands;**
- **conducting and promoting research to provide scientific and technological support for and understanding of wetland functions and values;**
- **pursuing co-operative international and federal-provincial habitat protection, research and management programs for fish and waterfowl, as agreed under treaties, conventions and other bilateral agreements; and**
- **promoting public awareness of wetland values and public participation in the conservation of wetlands.**

11. HYDROELECTRIC ENERGY DEVELOPMENT

Hydroelectric power is the renewable energy inherent in the force of falling water. The flow, the prime driving force, is continually replenished by the natural process known as the hydrologic cycle. This form of energy has been the mainstay of electrical generation in Canada, and, in the 1980s, provided 67 per cent of the electricity needed, while nuclear and conventional thermal power plants accounted for most of the remainder.

The electric power industry is self-sustaining, and prices for the electricity are set to meet costs. Variations in price generally reflect the mix of types of generation, and the size of the population served.

The Constitution gives provincial legislatures authority over the development, conservation and management of sites and facilities for electric energy production. The federal government, in co-operation with the territorial governments, has this responsibility in the North.

Currently, only one third of the national hydro potential is developed. But, the majority of undeveloped sites are uneconomic at present or environmentally incompatible; many of them are small capacity or low-head sites. Actual development will eventually depend upon a number of variables, including the technological advances in hydraulic power generation and transmission, the changing economics of electricity in the national energy mix, and technical and political changes relating to nuclear fission. Although hydroelectric sources produce energy without the pollution that accompanies thermal generation, the potential environmental impact of major hydro developments can be a constraint.

High-cost fossil fuels are making small-scale and low-head hydro appear increasingly attractive. There are clear economic advantages in installing small-scale units in isolated communities that rely on diesel-electric generation and which have little likelihood of integration into an electrical network. The resulting technology would also have an export potential to developing countries.

In order to ensure that long-term federal interests are met, the federal government will continue to:

- contribute to energy research and development, particularly when small-scale and low-head technology are involved;
- encourage integrated planning at sites where federal interests or financial support are involved or when more than one province is affected;
- compile and disseminate national statistics on dams and electric power in Canada; and
- encourage use of the Environmental Assessment and Review Process, or a provincial equivalent, so that potential adverse environmental and socio-economic consequences can be identified before implementation and, to the extent possible, mitigated.

12. NAVIGATION

Water is not only the basis of much Canadian outdoor recreation, but also serves as a very important method of transportation.

The legislative base for the federal government's activities in managing water resources for the greatest social and economic benefit of Canadians derives fundamentally from the Constitution Act. Among the major statutes relating specifically to the use of Canadian waters for navigation, and navigation itself, are the Boundary Waters Treaty Act, the Department of Transport Act, the National Transportation Act, the Canada Shipping Act, the Arctic Waters Pollution Prevention Act, and the Navigable Waters Protection Act. The federal government's specific powers over navigation and shipping under these and many other legislative instruments have important effects on water resources.

The Navigable Waters Protection Act provides for the protection of the public right of navigation. Under the Act, regulation of the construction and placement of "works" in any navigable waterway in Canada is the responsibility of the federal government. All waterways capable of supporting any type of marine craft, regardless of its mode of propulsion, are included. A long-established approval process provides for on-site inspections, consultation with other federal and provincial government departments and public input on major works such as bridges and dams.

Consistent with the objectives of providing for a safe, efficient and economic national marine transportation system, federal navigation agencies work in co-operation with provincial, territorial and international agencies and with other federal agencies to address problems associated with the protection of water quality, the marine environment and competing water uses.

The federal government is committed to ensuring the protection of the public right of navigation.

To meet this commitment, **the federal government will:**

- **continue to administer and enforce legislation related to navigable waters, in particular the Navigable Waters Protection Act and associated regulations;**
- **consider amendments to the Navigable Waters Protection Act so as to define "navigable waters," strengthen the approval process for major works and streamline the approval process for minor works;**
- **continue to play the lead role in the development, modification or improvement of works in main commercial shipping channels under federal jurisdiction, and influence or provide advice with regard to works in secondary commercial shipping channels;**
- **continue to apply the Environmental Assessment and Review Process to water-related projects; and**
- **continue actively to support national, international, provincial and territorial initiatives relating to good management of water resources where navigation is involved.**

13. HERITAGE RIVER PRESERVATION

Canada's rivers are a priceless and irreplaceable part of our natural and cultural heritage. Once a source of food and a means of transportation for aboriginal people and settlers, rivers also had a major role in our country's exploration, commerce and historical development. And they continue to play a large part in our lives, both in our working and leisure hours.

Unfortunately, with seemingly endless supplies of freshwater, Canadians have not always treated their rivers with the respect that they deserve. Many essentially natural river environments are in danger of being seriously compromised or polluted, and many historical resources along these corridors are in danger of being damaged or lost forever.

In response to these challenges, there has emerged a growing public expression of concern that rivers be managed wisely. Consequently, a series of federally sponsored wild river surveys were commissioned in the early 1970s to provide information on the scenic and recreational values of Canada's northern rivers. In late 1978, federal, provincial and territorial parks officials began working together to develop a nation-wide system of heritage rivers and on 18 January, 1984, the Canadian Heritage Rivers Board was formally established to administer the Canadian Heritage Rivers System (CHRS).

The primary objective of the CHRS is to ensure that rivers that are outstanding examples of Canada's natural heritage, that have played a significant part in Canadian history or that offer outstanding opportunities for recreation are managed in such a way that their distinctive heritage values are conserved while their potential for future public use and enjoyment is enhanced. The program is seen as a long-term one to designate and preserve nationally significant areas in which rivers are the predominant features. As of 1 January, 1987, 13 sections of 12 different rivers across Canada had been nominated to the CHRS; four of them are now designated as "Canadian Heritage Rivers."

Rivers may be nominated only by participating governments; private citizens or groups, however, may present submissions to their provincial or territorial parks agency concerning any rivers that they believe worthy of consideration based on natural, historic or recreational values. Each river designated as a "Canadian Heritage River" will help ensure that an important part of Canada's natural and cultural heritage will continue to have a significant role in the lives of future generations of Canadians.

To ensure that Canada's river heritage is preserved and managed for the use and enjoyment of all Canadians, **the federal government will:**

- **co-operate with provincial and territorial governments through the Canadian Heritage Rivers System to give national recognition to Canada's important historic, natural and recreational rivers or river segments, regardless of which government has jurisdiction over these waters;**
- **staff and operate a secretariat for the Canadian Heritage Rivers Board;**
- **provide technical and financial assistance to provincial and territorial governments for studies leading to the nomination of rivers to the Canadian Heritage Rivers System and for preparing management plans for the rivers, once nominated; and**
- **publicize the Canadian Heritage Rivers System both nationally and internationally.**

14. MANAGEMENT OF NORTHERN WATER RESOURCES

The North has a very sparse population and little municipal or industrial development. As a result, most of its waters remain in pristine condition. But the appearance of an abundant usable water supply given by the thousands of lakes, rivers and streams is misleading as much of the ground water is permanently frozen and the surface waters receive relatively little recharge owing to the low precipitation. Forecasts of climate change, however, suggest significantly greater water supplies may be expected in the future.

Water is of special value in the North as the breeding ground for the majority of North America's migratory birds, as a means of transportation, and as a sustaining force for the essentials of life for the native population: fish and wildlife for food, trapping and cash income; and recreation. It is also one of the main economic resources for the North's future, particularly hydroelectric development and resource industries.

The North has unique conditions that call for special measures and policies appropriate to its needs. One of these needs is to anticipate the downstream effects of upstream development in the provinces, as such a large portion of Canada's water flows northward. This is especially true of the upstream reaches of the Mackenzie River basin, in which several major development opportunities exist. Mine abandonment and reclamation of development projects in the North are issues that, although not unique to the North, are critical to the successful balance of environmental protection and economic development. Moreover, northern waters have a much lower natural cleansing capacity from the effects of pollution than southern waters.

The federal government is committed to the conservation, development and use of northern water resources for the greatest social and economic benefit of northern Canadians. To meet this commitment, the federal government sees a need to work with northerners through existing and evolving political, planning and regulatory systems:

- to provide a framework within which all northerners can participate in the planning and management of water projects that may affect their lifestyles and/or livelihoods;
- to maintain conditions that will ensure traditional water values are sustained, yet not sacrifice economic activities and opportunities for the region;
- to encourage good conservation practices now so that adequate water supplies will be assured for future uses;
- to establish mechanisms with the provinces regarding (trans)boundary waters to ensure that the region's interests are protected;
- to review the Northern Inland Waters Act with a view to producing legislation that responds better to the present needs of the North;
- to employ environmentally sound practices in development projects; and
- to integrate northern water resources planning within a framework involving all northern resources.

15. NATIVE WATER RIGHTS

Water is of special value as a sustaining force for the essentials of life for Canada's native people.

In recent years, native people have demonstrated they are prepared to assert their interest in, as well as participate in, managing water resources. In this way, they are taking steps to protect their distinctive way of life and to determine their own destiny.

Native people stress their traditional close relationship with nature and their determination to preserve their aboriginal claims related to water. They emphasize their vulnerability to externally imposed changes in the water regime on which their communities depend.

For these reasons, water and water management are important issues in negotiations of land claims between the federal government and native groups.

One native land claim in the western Arctic has been negotiated; in this case, the federal government has explicitly recognized the native peoples' aboriginal interest in water but regards the water itself as part of the public domain. Aboriginal and treaty water rights and participation in water management have also been raised by native people as important concerns in many areas of the country, in particular, Ontario, the Prairie Provinces and British Columbia.

Native land claims in the territories may have to be resolved in a different way from that used to settle native water rights issues "south of 60." The federal government administers the resources in the former, whereas provinces are the principal administrators in the latter.

In its sphere of influence, the federal government is striving to balance the goal of maintaining natural conditions for streams (and protecting traditional uses) with the endeavours of others whose goals are directed to resource or economic development.

In recognition of native people's special interests in water, the federal government will:

- negotiate land claims settlements that define use and management powers for waters within claimed areas;
- review and clarify with native people their water-related issues and interests with respect to their treaty areas as well as to lands subject to land claims;
- improve understanding of native needs and commitments associated with water;
- determine, in consultation with native people, how they will participate in resource management programs affecting water resources of interest to them; and
- encourage greater native participation in water allocation and management decisions involving instream and traditional uses.

16. CANADA-U.S. BOUNDARY AND TRANSBOUNDARY WATER MANAGEMENT

The long and generally amicable relationship between Canada and the United States in dealing with problems and opportunities respecting boundary waters is largely due to the safeguards contained in the Boundary Waters Treaty signed in 1909. The Treaty is a remarkable document; although it was written some 80 years ago it embodies such foresight and flexibility that it remains relevant today and has had to be amended only once, in 1950, to deal with special issues relating to the Niagara River. In setting limitations on the freedom with which each country could act, the Treaty provided controls on water levels and flows and pioneered restrictions on boundary pollution many years before environment became a major concern; it provided a forum for interests to be heard long before public participation became a prerequisite for resource planning; and it specified certain rules for settling disputes.

On several occasions, as in the case of the Niagara and Columbia River Treaties, the two governments have commissioned their own agencies to prepare joint plans for the resources in question. Usually, however, this role is assigned to the International Joint Commission (IJC), composed equally of Canadian and United States representatives. After the planning stage, the country in which the resource is located normally manages the resource to satisfy its regional and national objectives, as long as such management is not detrimental to its international obligations under the Boundary Waters Treaty. Thus far, the national governments have referred more than 100 issues to the Commission. In all but a few cases, the Commission has reached a unanimous decision, and, for the most part, the governments have accepted its recommendations.

Over time, the IJC has evolved into an effective institution for helping governments resolve boundary water problems without rancour. The Great Lakes Water Quality Agreement is a good example of the Commission's efforts to improve and protect a shared water resource for the benefit of both Canada and the United States.

The federal government is committed to ensuring that water management actions, and activities that affect boundary waters, are consistent with the principles of the Boundary Waters Treaty of 1909.

In meeting its commitment, **the federal government will continue to:**

- **ensure that both nations adhere to the Boundary Waters Treaty when managing boundary water matters;**
- **regulate development on the Canadian portion of international rivers to ensure that transboundary implications are taken into account;**
- **consider IJC recommendations on boundary water issues, with a view to ensuring Canadian needs are addressed in the spirit of international co-operation;**
- **refer international disputes to the agency deemed by both governments to be best suited to handle them, normally, but not exclusively, the IJC; and**
- **participate with and support that agency to ensure that it has adequate resources, especially if requested to take on additional tasks or major studies.**

17. POTENTIAL INTERJURISDICTIONAL WATER CONFLICTS WITHIN CANADA

Provincial boundaries only occasionally follow a natural division like a watershed. Many of Canada's major water bodies and hundreds of streams straddle or cross jurisdictional boundaries.

As pressures on water resources grow, there is an increasingly urgent need to ensure that when Canadians in one jurisdiction use water, they take account of the values gained or foregone in other jurisdictions.

Provinces always have access to courts to resolve water disputes with other provinces or with the federal government, but the implications of legal decisions usually extend beyond the issues at hand and can be detrimental to future co-operative management of the shared resource. Wishing to avoid binding litigation that could have negative effects for one or all parties, governments may hesitate to initiate water developments in basins of shared jurisdiction.

In the interest of managing shared water resources with a minimum of confrontation, a mechanism is required to address potential and actual conflicts between jurisdictions. The federal government is prepared to co-operate with the provinces in developing such a mechanism.

To this end, the federal government proposes:

- that interjurisdictional water resource problems arising from pollution or regulation of waterways be solved, where possible, by agreements between the jurisdictions concerned;
- that steps be taken to develop appropriate procedures so that in cases where the jurisdictions involved have tried but failed to reach agreement, and where the issue has become a major concern to one or more of the jurisdictions, those disputes can be referred to mediation or arbitration; and
- to negotiate with the provinces the development of a mechanism which would allow for the ultimate resolution of interjurisdictional disputes in cases where all other means of reaching agreement have failed.

18. INTERNATIONAL WATER RELATIONS

Until recently, Canada's management of its freshwater resources involved dealings with few countries other than the United States. This limited international involvement was in support of humanitarian assistance and the export of Canadian technology, both of which are becoming increasingly important and warrant continued federal support.

It is now recognized, however, that Canada's water is an interdependent part of a finite global water system. Consequently, the quality and quantity of Canada's water depend, to a considerable extent, upon international efforts to minimize environmental degradation. Canada is committed to conserving and protecting the quality of these water resources. Accordingly, it will continue its participation in various international organizations and forums in the ongoing effort to reduce such global problems as the long range transport of air pollutants, man-induced climate change and desertification.

The general objectives of the federal government's international water management activities are to maximize the potential economic benefit to Canadians by encouraging international, multilateral and bilateral collaboration in the development of water management knowledge, expertise and technology; to provide humanitarian assistance in alleviating water problems; and to encourage the reduction of environmental damage by man to the biosphere. The federal government is obliged to assess environmental effects when considering assistance to other nations.

The federal government is committed to increased collaboration with other nations in freshwater research and management, and to encouraging other levels of government, research institutions and industry within Canada to co-operate in such international collaboration and to protect and advance Canada's economic interests abroad.

To achieve these commitments, the federal government will continue its support of international water activities through:

- support for the United Nations and other multilateral institutions active in international water research, water management and related environmental fields;
- encouragement of international efforts to reduce global environmental degradation;
- provision of training and of humanitarian, economic, scientific and technical assistance to other countries in the management of water quality and quantity and
- prudent involvement in bilateral agreements that support the exchange of scientific knowledge and expertise and the export of Canadian industrial and technological products.

19. DROUGHT

Drought is a natural phenomenon that results from the prolonged absence or infrequency of precipitation. Drought is relatively rare in Canada, but some areas are more susceptible than others. In particular, a significant region of the prairies leeward of the Rocky Mountains is subject to sparse precipitation. These conditions have produced a semi-arid area encompassing parts of both Alberta and Saskatchewan where there is a meagre margin between the supply and demand, even in normal years.

There are two main categories of drought - an agricultural drought and a water drought. Agricultural drought is reflected in abnormally low soil moisture over an area or region; a water drought occurs when water supply, as measured by streamflow, lake levels and ground water levels, is abnormally low. This policy addresses the latter condition.

Although drought occurs naturally, it is aggravated by human actions, in particular the demands placed upon the water resource and changes in climate as they occur.

The federal government is prepared to support provincial initiatives directed to managing water supplies to realize their full value and to resolving real and potential problems associated with droughts.

To this end, **the federal government will:**

- **encourage and promote water demand management approaches and conservation technology with a view to extending the use of limited supplies;**
- **undertake, support and promote research into improving understanding of drought;**
- **encourage the development and dissemination of water conservation technologies and practices to promote the best use of current supplies; and**
- **encourage an integrated approach to planning and managing the augmentation and allocation of water supplies.**

20. FLOODING

With few exceptions, Canadian communities are located along the banks of rivers or lakes because of the special advantages offered - water supply, recreation, transportation, relatively level land for building, fertile land for crops and a pleasant view. When those communities forget that the river has a prior right to floodplains, however, they pay a steep price either through expensive flood control works or in flood damages.

Epic floods have occurred in the Fraser River Valley, the Red River Valley and the Humber Valley near Toronto, requiring significant levels of federal assistance in the form of flood control works and disaster assistance. As damages kept growing, so too did federal disaster assistance payments.

Subsequent widespread flooding throughout Canada in the early 1970s, however, prompted a new approach to reduce flood damages. Under the auspices of federal-provincial-territorial bilateral agreements, flood-risk areas are identified and designated, and further vulnerable developments in those areas are discouraged. Where existing development warrants, flood protection works may be constructed.

The full range of flood-protection alternatives includes flood-risk mapping, flood warning and forecasting, flood routing through property easements, land-use adjustments through zoning and acquisition, flood proofing of structures, and traditional structural solutions such as upstream storage, stream straightening, flood by-passes and dykes.

The flood damage reduction program focusses primarily on centres of population in high-risk areas where potential flood damage could exceed the threshold level for the federal disaster assistance program, but it can include suburban and undeveloped areas with a high potential for development.

The federal government is committed to alleviating human suffering caused by floods and minimizing the costs of flood damages.

To meet this commitment, **the federal government will:**

- **co-operate with the provinces and territories in compiling appropriate data that will make it possible to identify areas of flood risk and discourage inappropriate development in those areas;**
- **provide the public with information on floods, federal policies and programs and on the susceptibility of specific areas to flooding;**
- **after designation, neither support nor provide disaster assistance coverage to new flood-vulnerable development;**
- **consider contributing to flood-control works to protect existing development where federal interests are threatened or where flood damages are likely to have significant national implications;**
- **provide for assessment of the effectiveness of various flood-protection alternatives, taking into account costs, benefits and environmental impacts, and encouraging the best combination of alternatives for an agreed level of protection; and**
- **encourage assessments of the environmental impact and social implications of large flood-control structures.**

21. SHORELINE EROSION

Erosion occurs along the shore of almost any lake, river or canal, as a result of wind, moving water or ice. Shoreline erosion also can be caused by wave action from commercial shipping.

Development of shoreline property should take these phenomena into consideration, especially in areas with high erosion rates. Effects range from partial loss of land and structural building damage to a total loss of land and buildings. Protection works have proved to be limited in duration and very costly, and they often increase the damage to other shore properties by redirecting the natural forces in unexpected ways.

The federal government bears no responsibility for, and cannot regulate, natural erosion. Accordingly it will not undertake or participate in the construction of works intended to eliminate or reduce damages from natural erosive causes.

Rather, it supports the concept of minimizing damages caused by natural erosion along shorelines by discouraging settlement of and investment in areas subject to natural erosion.

To this end, **the federal government will:**

- **participate in programs intended to delineate areas subject to a serious erosion hazard where there is a significant national interest; and**
- **consider undertaking remedial measures in certain cases where erosion damage has been caused by wave action from commercial shipping or by the existence of a federal structure in the waterway, or in cases where federal facilities or lands are subject to damage.**

22. CLIMATE CHANGE

The composition of the earth's atmosphere is undergoing significant global changes. These changes result partly from human activities such as increased urban development and industrialization, surface modification from different land-use practices and, in particular, the burning of fossil fuels that have inadvertently increased the amount of carbon dioxide and other gases in the atmosphere. There is now growing scientific evidence that increasing concentrations of these gases could result, over the next few decades, in a rise of global mean temperature greater than any in man's history. This atmospheric warming is expected to be greatest at middle and high latitudes and it will be accompanied by significant alterations in global wind and precipitation patterns. Canada's geographic location makes it among the areas of the world likely to experience the greatest climatic changes.

Because hydrological processes are so intimately related to atmospheric processes, any change in climate will have profound effects on the supply of and demand for water, as well as on the design and management of water resource projects. Climate warming can alter the break-up and freeze-up regimes of northern rivers, affecting navigation; increase the aridity in southern regions, requiring the adjustment of water systems, allocations and regional land-use and development; and change the snow cover and ice fields, affecting the timing and amount of snowmelt runoff and subsequently affecting flood flows, hydro production and water supply. Any large-scale water projects, particularly those involving the southward diversion of northern rivers, not only would be vulnerable to the effects of climate change but could also be partly responsible for causing such changes. Engineering design that does not allow for climatic change could have dire consequences. Examples include potential failures or inadequacies of spillways, flood proofing and storage reservoir sizing.

The Canadian Climate Program (CCP) was established in 1978 to study climate change and to integrate the efforts of various federal and provincial agencies, universities and the private sector in the field of climatology. One of the program's components has, since 1984, focused on research studies to assess and identify the potential social and economic impacts of the climate warming expected under a doubling of the carbon dioxide in the atmosphere.

To meet the needs of the water resources sector in addressing the potential problems associated with climate change and variability, **the federal government, through the Canadian Climate Program, will:**

- **improve the availability and interpretation of climate data and services;**
- **make effective use of climatological information in water resource planning and management;**
- **conduct further research on the relationship between climate and water resources; and**
- **conduct further research on the impact of climate change and variability on water resources.**

23. WATER DATA AND INFORMATION NEEDS

At the turn of the century, basic water quantity and meteorologic surveys were initiated to meet specific needs associated with transportation, hydroelectric power, fisheries and agriculture. Today, the need has grown to include hydrological and socio-economic data on streamflows, water levels, water quality, water use, ground water, precipitation (rain and snow), evaporation, ice and other parameters to enable water managers to understand past and present conditions and to anticipate future needs.

As the complexity of water management has increased, so has the need for reliable and cost-effective data gathering systems. Recognizing these needs, the federal and provincial governments have entered into agreements that set out their respective responsibilities with regard to data collection, costs and data availability. Such data and the information derived from that analysis and interpretation will continue to grow in importance to all levels of government, to industry and to Canadians in general as appreciation of the value of water grows.

Under the federal government's constitutional responsibilities relating to census and statistics, it ensures that a basic level of data and information on Canada's water resources is available to protect the health and well-being of Canadians and provide a basis for sound economic development.

The federal government is committed to maintaining co-operative data programs with the provinces and territories in the interest of understanding and managing the resource for the common good.

To this end, **the federal government will:**

- **work with the provinces and territories to produce reliable and timely data and information on the quantity, quality and variability of the nation's water resources;**
- **encourage the extension of data programs into the North and generally remote areas;**
- **maintain and promote the use of a range of national water data-bases, as well as a comprehensive directory of water-related data and sources of such data and information;**
- **encourage the integrated planning of information-gathering systems;**
- **augment certain data holdings on, for example, water use, water pricing, or ground water, when they are needed to deal with new issues;**
- **undertake and promote new technology appropriate for general use across Canada; and**
- **implement cost-recovery policies for data and information, recognizing that basic data constitute a common good.**

24. RESEARCH LEADERSHIP

The federal government has a responsibility to provide leadership in water research in fields relevant to the understanding of current and future water issues of national significance. It also conducts and encourages the undertaking of physical, chemical, biological and socio-economic investigations to address and assist in the determination of water and related resource values, as well as to help resolve water problems of national and regional importance.

To encourage a healthy and creative water science community in Canada, the federal government supports the concept of centres of excellence that can respond to fundamental questions of water research. Its national role also includes the need to provide assessments of the current and emerging needs of water research and to participate as a full partner in the world science community.

The federal government recognizes this responsibility and, to meet it in the most effective way, **proposes to maintain a continuing commitment to:**

- **providing leadership in water research directed to supporting national and significant regional requirements;**
- **establishing research advisory mechanisms, with broad representation from the research clientele, to advise on research needs and priorities;**
- **conducting targeted basic research, applied research and experimental development directed to current and emerging water issues important to the federal government;**
- **conducting and encouraging research on the value of water in its many uses;**
- **regionalizing research efforts so that, when feasible, issues will be dealt with in the region in which they arise; and**
- **co-operating with and encouraging private-sector research efforts by supporting commercial access to government research facilities.**

25. TECHNOLOGICAL NEEDS

Sound management of Canada's water resources requires a comprehensive information base and the development and application of new and improved technology to reduce increasing water demands and prevent or mitigate pollution of the resource. Technological development based on research into the ways in which the amount of water used in industrial or other processes can be decreased could significantly reduce the total quantity of water necessary to produce or provide the goods and services demanded by society.

New or improved technology to prevent or mitigate the accumulation of harmful industrial wastes or by-products in the atmosphere and in our water could reduce risks to human health as well as adverse environmental effects. Similarly, such risks could be reduced and public fears allayed by developing safe and economical disposal methods for toxic and nuclear wastes. Developments in the field of biotechnology could prevent the harmful effects of pesticides and herbicides on life forms other than those specifically targeted. The requirement for more sophisticated and integrated data systems to deal with the increasing scope and complexity of water information calls for technological innovation and development in information systems. In addition, the technological advances noted above not only would meet the needs of Canadians but also could become commodities for sale or transfer abroad.

The scope for new and improved technological efficiency in water use and supply is broad, and the benefits appear to warrant a more concerted effort on the part of governments, in partnership with the private sector, to pursue and support developments in this area. The federal and provincial roles in technological development and transfer are complementary, with regional leadership coming from the latter and national leadership from the former.

In meeting its role, **the federal government will:**

- **support research directed to technological development;**
- **demonstrate national leadership by undertaking, supporting and promoting technological research, development and transfer;**
- **co-ordinate federal and provincial efforts through such forums as the Research and Development Co-ordination Committee of the Canadian Council of Resource and Environment Ministers;**
- **facilitate the transfer of technology between Canada and other countries; and**
- **implement appropriate technologies to meet federal responsibilities at federal facilities.**

Appendix A

Constitutional Foundation

CONSTITUTIONAL FOUNDATION

The Constitution Act does not contain direct reference to the water resource. Nevertheless, the provinces exercise proprietary rights over the resources, hence the water, within their borders. Their competence to legislate in water matters derives from their jurisdiction over management of public lands, over property and civil rights and over matters of a local and private nature. Provinces, therefore, have authority to legislate in areas of domestic and industrial water supply, pollution control, non-nuclear thermal and hydroelectric power development, irrigation, and recreation. They have delegated some of this responsibility to local government bodies.

The federal government has proprietary rights regarding federal lands and water in the territories, national parks, and Indian reserves. Parliament has exclusive legislative jurisdiction over commercial navigation, a power that extends over most watercourses of significant size. Parliament also has exclusive legislative jurisdiction over both inland and ocean fisheries, including their protection in river basins. It shares jurisdiction with the provinces in agriculture and health.

Parliament also has the residual power to legislate for the peace, order and good government of the country, regulation of trade and commerce, banking, taxation and the public debt, census and statistics, defence and criminal law. Under its declaratory power, Parliament may bring into federal jurisdiction a local work declared to be of general advantage to Canada or to two or more provinces.

The federal government is responsible for conducting relations with other countries, an extremely important power in relation to water as so much of Canada's water resources are in boundary water basins.